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ABSTRACT

This teacher's guide contains materials to be used in the study of fish and seafood and their contribution in the present and future to feeding the world's people. The guide's one unit provides an overview of the various uses of fish and seafood in various cuisines, their nutritional qualities, their various classifications and forms, and the principles and techniques of fish cookery. The unit contains a list of objectives (e.g., identify the nutritional contributions and advantages of fish), suggested activities for instructor and student, and instructional materials (information sheets, e.g., fish and seafood in cuisines throughout the world), transparency masters (e.g., market forms of fresh fish), assignment sheets (e.g., word scrambles), tests (multiple choice, matching, and essay), and an answer key. The unit also includes a list of reference books, articles, and films. (CT)

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ED172892

WORLD FOODS

FISH AND SEAFOOD--THE PRESENT AND FUTURE USE IN WORLD FOODS

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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WORLD FOODS

CONCEPTUAL STRUCTURE

MAJOR CONCEPT I — Implication of World Foods

- A. Cultural Food Patterns
- B. Nutritional Deficiencies in the United States and Abroad
- C. Organizations Participating in Universal Health Programs

MAJOR CONCEPT II — International Foods - Regional Foods

- A. Culture and Food Patterns
  1. Political
  2. Social
  3. Economic (population)
  4. Geography (ecology)
  5. Religion
  6. Processing and Production
  7. Techniques of Cooking
- B. Nutrition
  1. Population
  2. Diet and Disease
- C. Food Preparation
  1. Equipment
  2. Resources
  3. Meal Service
  4. Food Storage and Preparation
  5. Equipment and Use of Available Resources

MAJOR CONCEPT III — Careers in Food and Nutrition

- A. Opportunities
- B. Qualifications
- C. Personal Satisfaction

WORLD FOODS

FISH AND SEAFOOD--THE PRESENT AND FUTURE USE IN WORLD FOODS

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FOREWORD

Fish and seafood are an important worldwide resource for protein. Fish and seafood do provide high quality protein and important vitamins and minerals. However, inadequate knowledge of the varieties available and of preparation methods often limits the use of these foods in the diets of many students.

There also persists an antiquated idea that the ocean will provide an unlimited potential for world food production. Fish and seafood, however, do have the potential for a significant contribution to world food production and consumption. In order to improve their role and utilization, an examination of the present and future use of fish and seafood in world food should be made.

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FISH AND SEAFOOD
UNIT I

UNIT OBJECTIVE

After completion of this unit, the student should be able to identify the uses of fish and seafood in various cuisines, the nutritional contributions of fish and seafood, the various classifications and forms of fish and seafood, principles and techniques of fish cookery, and to describe some of the present and future uses of fish in the world food supply. Achievement of this objective will be evidenced through the completion of assignment sheets and by scoring at least eighty-five percent on the unit test.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Identify fifteen uses of fish and seafood in the cuisines of Southeast Asia, China, Scandinavia, Germany, Netherlands, Hungary, France, Spain, Latin America and South America.

2. Identify the nutritional contributions and advantages of fish.

3. Recognize the two basic classifications and subdivisions of fish.

4. Name the four market forms of fish and at least two indicators of quality in each market form.

5. Describe three basic principles of the preparation of fish and name six methods used in the preparation of fish.

6. Describe three commercial methods of catching fish and two major problems in the use of these methods.

7. Discuss in a short paragraph the advantages and limitations of fish farming in world food production, including new experimental methods.

8. Describe fish protein concentrate and discuss in a short paragraph the advantages and limitations of its use in world food production and consumption.

SUGGESTED ACTIVITIES

I. Instructor:

A. Survey the types and forms of fish and seafood available in local markets.

B. Provide students with objectives sheet.

C. Provide students with information and assignment sheets.

D. Make transparencies.

E. Discuss unit and specific objectives.

F. Discuss information and assignment sheets.

G. Evaluate assignment sheets.

H. Give unit test.

I. Evaluate unit test.

II. Student:

A. Read objectives.

B. Study information sheet.

C. Complete assignment sheets.

D. Make sure that you are able to perform the specific objectives.

E. Take test.

INSTRUCTIONAL MATERIALS

I. Included in this unit:

A. Objectives

B. Information sheet

C. Transparency masters

1. TM-1: Fish and Seafood Classifications

2. TM-2: Market Forms of Fresh Fish

3. TM-3: Market Forms of Processed Fish

4. TM-4: Methods of Preparing Fish and Seafood

D. Assignment sheets

1. Assignment Sheet #1: Fish and Seafood in World Foods Crossword Puzzle

2. Assignment Sheet #2: Fishing for Food Scramble

E. Answers to assignment sheets

F. Test

G. Answers to test

II. References:

A. Books

1. Borgstrom, George. *The Hungry Planet.* New York: The MacMillan Co., 1967.

2. Brown, Lester R. with Erik P. Eckholm. *By Bread Alone.* New York: Praeger Publishers, 1974.

3. Cote, Patricia. *People, Food and Science.* Lexington, Massachusetts: Ginn and Co., 1972.

4. Derecskey, Susan. *The Hungarian Cookbook.* New York: Harper and Row, 1972.

5. Dumont, Rene and Rosier, Bernard. *The Hungry Future.* New York: Frederick A. Praeger, 1969.

6. *Grand Diplome Cooking Course Volume 3.* United States: Phoebus, 1972.

7. Hale, William Harlan. *The Horizon Cookbook.* New York: Doubleday and Co., 1968.

8. Hey, Nigel. *How Will We Feed the Hungry Billions?* New York: Julian Messnew, 1971.

9. *International Book of Fish and Egg Dishes.* London: Crescent, 1974.

10. McDermott, Irene; Norris, Jeanne; and Nicholas, Florence. *Homemaking for Teenagers-Book II.* Peoria, Illinois: Chas. A. Bennett Co., 1972.

11. Medved, Eva. *The World of Food.* Boston: Ginn and Co., 1970.

12. Morr, Mary and Irmiter, Theodore. *Introductory Foods.* New York: The MacMillan Co., 1970.

13. Nagel, Werner O., Compiler. *Cy Littlebee's Guide to Cooking Fish and Game.* Published by Missouri Department of Conservation.

14. Norman, Barbara. *The Spanish Cookbook.* New York: Bantam Books, 1971.

15. Ortiz, Elisabeth Lambert. *The Complete Book of Caribbean Cooking.* New York: M. Evans and Co., 1973.

16. Perl, Lela. *Red-Flannel Hash and Shoo-Fly Pie.* Cleveland, Ohio: World Publishing Co., 1965.

17. Pollard, Belle. *Experiences With Foods.* Chicago: Ginn and Co., 1961.

18. Richards, Mary Anne. *Favorite Recipes of Home Economics Teachers, Foreign Foods.* Montgomery, Alabama: Favorite Recipes Press, 1967.

19. *'Round the World Cooking Library; Chinese Cooking.* New York: Garland Books, 1973.

20. *'Round the World Cooking Library; Dutch and Belgian Cooking.* New York: Garland Books, 1973.

21. *'Round the World Cooking Library; German Cooking.* New York: Garland Books, 1973.

22. *'Round the World Cooking Library; Latin American Cooking.* New York: Garland Books, 1973.

23. *'Round the World Cooking Library; Scandinavian Cooking.* New York: Garland Books, 1973.

24. Steinberg, Rafael. *Pacific and Southeast Asian Cooking.* New York: Time-Life, 1970.

25. Tighe, Eileen Ed. *Woman's Day Encyclopedia of Cookery Volume 5.* New York: Fawcett Publications, Inc., 1966.

26. Trager, James. *The Foodbook*. New York: Grossman Publishers, 1970.

27. *World Food and Nutrition Study*. NRC Study on World Food and Nutrition, Washington, D.C.: National Academy of Sciences, 1975.

B. Articles

1. *"Fish: the Budget and Palate Pleaser," Forecast for Home Economics*. (April 1976)21: 26-27.

2. *"Function of Food in Nutrition."* Chicago, Illinois: National Livestock and Meat Board, 1970.

3. *"Seafood Species Chart."* National Fisheries Institute, Inc., 1730 Pennsylvania Ave. N. W., Washington, D.C. 20006.

4. *"Something Fishy," Co-ed*. (April 1976)21: 58-59.

C. Films

1. *Sockeye Odyssey*. This film depicts life cycle of the sockeye (red salmon) and research being conducted to conserve the species. 1970-Sound-14 min.

2. *Salmon Catch to Can*. Life cycle of salmon and three common ways of catching them and followed by steps involved in canning them. 1960-Sound-14 min.

3. *Catching, Filleting, Packaging*. Shows modern method of catching fish, also shows the processing of fish for market. Sound-11 min.

4. *Fish Cookery With Savoir*. Presents Monsieur Savoir, an imaginary and imaginative master of fish cookery. Sound-14 min.

5. *Fishery Products Standards*. Emphasizes the importance of maintaining the quality of fish products at the highest standards. The film uses fish sticks as examples. Sound-1957-14 min.

6. *Flavor of Maine*. Tells the story of Maine Sardine Industry. Shows methods of capture, processing and various methods of serving. 1966-Sound-14 min.

7. *Fresh Out of the Water*. Tells the complete story of handling of fish from time they are caught until they are served. 1957-Sound-14 min.

8. *Mullet Country*. Catching, processing, cooking and serving of the mullet. Sound-14 min.

9. *Outdoor Fish Cookery.* Presents age old and modern out-of-doors fish cookery in the United States. Salmon bake in Pacific northwest, Virginia oyster roast, New England clambake, perch in Michigan, mullet smoking in Florida, fish fry in Ohio, shrimp boil in Louisiana, etc. Sound-28 min.

10. *Sardines From Maine.* Tells complete story of Maine sardine from ocean to consumer. Shows catching, processing and serving. 1957-Sound-14 min.

11. *Trout USA.* Tells the story of commercial trout farms and how they supply America's tables as well as ponds and streams for fishers. Sequences on cooking and serving. Sound-14 min.

12. *Shrimp Tips From New Orleans.* Recipes for serving shrimp. Shows the influence that foreign countries have had upon the eating habits of New Orleans. 1957-Sound-14 min.

13. *Shrimp, Please.* Shows the manufacturing of shrimp in Mississippi and Louisiana, from catching through serving. 1955-Sound-21 min.

Films 1 through 13 are available from:

National Oceanic and Atmospheric Administration
U.S. Department of Commerce
Motion Picture Service
12231 Wilkins Avenue
Rockville, Maryland

(Book 6 months in advance)

14. *Survival of the Pacific Salmon.* Shows Army's work in creating upstream dams for salmon's travels. 1968-Sound-25 min.

Available from: U.S. Army Engineer Division
North Pacific
210 Custom House
Portland, Oregon 97209

15. *The Way of Trout.* Exciting life history of trout, their birth and fight for life. 1970-Sound-28 min.

Available from: Trout Unlimited
4260 E. Evans
Denver, Colorado 80222

(Book 2-3 months in advance)

16. *The Fresher the Better.* Preservation of seafoods by radiation pasteurization. 1966-Sound-13½ min.

Available from: U.S. Atomic Energy Commission
USAEC
P.O. Box 62
Oak Ridge, Tennessee 37830

(Book 3 weeks in advance)

17. *Arctic Fishing.* Shows trout fishing in the Seal River. Sound-14 min.

Available from: Quebec Government House
The Film Officer
Rockefeller Plaza
17 W. 50th Street
New York, New York 10020

18. *Argentina Fishing Paradise.* Outlines the many opportunities for excellent fishing that are available in Argentina. Sound-14 min.

Available from: Embassy of Argentina
Cultural Office
1600 New Hampshire Avenue, NW
Washington, D.C. 20009

19. *Bush Country.* Presents a family fishing trip in Quebec's remote lac Bleu. 1959-Sound-20 min.

Available from: Telefilm Ltd.
P.O. Box 709
Homosassa Springs, Florida 32647

(Book 2 months in advance)

20. *Discovery in Bermuda.* Features the fishing in Bermuda. Sound-22 min.

Available from: Johnson Outboards
Solanas Studios
4365 N. 27th Street
Milwaukee, Wisconsin 53216

21. *Fishing in Alaska.* Sport fishing with beautiful scenery of Alaska. 1973-Sound-27 min.

Available from: Piccadilly Films International
Co., LTD.
715 Stadium
San Antonio, Texas 78284

22. *Fishing in Scotland.* Depicts salmon, grayling pike and trout--some of the many different kinds of fish that abound in the lochs and rivers of Scotland. Sound-21 min.

Available from: Public Service Audience Planners Inc.
205 S. LaSalle Street
Chicago, Illinois 60604

23. *Fish From Denmark.* Features the fishing industry of Denmark. It follows the catch through the various processing steps. Sound-25 minutes.

Available from: Royal Danish Consulate General
Danish Information Office
280 Park Avenue
New York, New York 10017

ADDRESSES:

Arkansas Department of Parks and Tourism
149 State Capitol Building
Little Rock, Arkansas 72201

C & H Sugar Company
Department 742, One California St.
San Francisco, California 94106

Maine Sardine Council
P. O. Box 2426, 15 Grove St.
Augusta, Maine 04330

Association-Sterling Films
Executive Offices
866 Third Avenue
New York, New York 10022

FISH AND SEAFOOD
UNIT I

INFORMATION SHEET

I. Fish and seafood in cuisines throughout the world

A. People of Southeast Asia and the Pacific Islands are surrounded by oceans and thus consume large amounts of fish in their diets.

1. People of this region frequently eat raw fish such as lomi lomi-salmon which consists of salted salmon fillets with onions and tomatoes added.

2. Luaus start with tender fish steamed in ti leaves, then squid which has been cooked in coconut milk and tiny fresh water shrimp are served.

3. Samoans wrap seafood in taro, banana and breadfruit tree leaves and cook it in glowing coals which produces a dish called Imu.

4. A popular Tahitian dish is Poissoncru, a simple dish made of raw fish, usually tuna, marinated in salted lime or lemon juice; the juices are squeezed out and the fish then soaked in coconut milk.

(NOTE: The acid in the juice "cooks" the fish as heat would cook it.)

5. A famous dish in the Phillipines is a fish paste named bagoong (pronounced ba-go-ong) which is made by fermenting a tiny fish called dilis in sea water left to stand for weeks until the water is evaporated and then pounded into a paste.

B. China has many sea outlets and rivers, thus fish are abundant and play an important role in Chinese cuisine.

1. Although Chinese use both fresh and saltwater fish, the fresh water varieties are predominant.

2. Also included in Chinese diets are large amounts of seafoods such as crab, lobster, shrimp, scallops, clams and oysters.

3. In the preparation of fish in China, the aim is to preserve the natural flavor and appearance which Chinese feel not only provides aesthetic qualities but also improves flavor.

a. When preparing the fish only scales and entrails are removed; the fish is then cooked whole with head, tail and fins still attached.

b. The two preferred methods of preparation are steaming and simmering, making the fish both tender and moist.

(NOTE: Sometimes they also pan fry, deep-fat fry or stir-fry the fish.)

c. Ginger, garlic, scallions, black beans, soy sauce and wine are often used to season fish.

d. Scoring the fish permits the flavors to be absorbed into the meat easily and exposes a greater cooking surface.

e. Sweet and sour sauces are often used in seafood dishes.

f. Raw fish are also eaten in a variety of ways.

C. The Scandinavian countries of Denmark, Norway, Sweden and Finland have more ways of drying, smoking and curing fish than anywhere else in the world.

1. Danes are fond of Smorrebrod which literally means bread spread with butter, but frequently this open sandwich is piled with layers of thick slices of smoked fish, cold fish or shellfish.

(NOTE: Norwegian spelling is Smorbrod.)

2. Fish and potatoes are staple foods in Norway.

a. Norwegians dry cleaned fish on horizontal bars in the ice cold north wind, producing a very hard fish.

b. Cod fish that has been salted and dried on cliffs in open Nordic air is called Klippfish.

(NOTE: In many other countries herring or salmon that has been cleaned and preserved by salting, or smoking is called Kipper.)

3. In Sweden the Baltic Herring is used in a variety of shapes, forms and flavors including marinated, smoked, in cream sauce and in Piquante sauce (a lemon sauce).

4. Lutfisk, a Swedish traditional specialty is fish soaked and pickled in a mixture of wood ash, lime, soda and water until it is approximately 4 times its original size and then dried.

   (NOTE: A liking for this is very much an acquired taste.)

5. The Laplanders have fresh trout, salmon and fresh turbot caviar.

D. Fish is popular in the Netherlands, a country surrounded by rivers, lakes and canals.

1. Dutch are especially famous for two unique fish delicacies, including herring, which comes from the sea, and eel, which comes from the inland waters.

2. The first herring catch is celebrated with festivals.

3. In Holland, people frequently take the soft oyster flavored herrings by the tail, throw their heads back and let the fish slide down their throats.

4. Fat eels are smoked until soft and golden and served warm on toasted bread or as hors d'oeuvres.

5. Belgium imports a great deal of mussels and oysters yearly which are caught off the Dutch coast.

   a. Mussels are an important national dish in Belgium and they are eaten the year round with French fries and beer.

   b. Tiny grey shrimp are another of Belgium's specialties.

E. Some popular types of fish found in Germany are halibut, flounder, eel, herring, salmon and trout.

1. A German delicacy is both smoked salmon and smoked trout.

2. Germans are famous for their stews, including fish stews.

3. Trout from the numerous small brooks of German mountains are considered a sort of national fish and they are frequently poached and served with melted butter.

F. Although Hungary is a landlocked country, fresh fish from its lakes and streams are popular, including the most famous fresh fish called fogas, a delicately flavored pike-perch, or a giant perch, from Lake Balton in the western part of the country and the only place in the world where it lives.

G. The French use many kinds of fish in their dishes including scallops, shrimps (large shrimp are called scampi), mussels, oysters, lobster, cherry-stone clams, Dungeness crabs and blue crabs.

1. The seasons of the year barely change the supply of fresh shellfish that is available.

2. Edible snails, called escargot, have been gourmet fare for many years.

H. The people in Spain enjoy a variety of shellfish, Hake (a popular white fish), cod and halibut.

I. With their some 7,000 miles of coastline and two oceans, Latin Americans use endless varieties of fish.

1. Fish are a major source of protein in the coastal areas.

2. Fish are pickled, smoked, curried, stewed, stuffed and served with sauces.

3. Since Mexico has a long coast, fish are available in abundance including snapper, red snapper, pompano, flounder, perch, bluefish, mackerel, black or striped bass, tuna, and brill, along with shellfish varieties like oysters, shrimp, clams, abalone, conch, turtle, mussels, crayfish and prawns.

a. Mexicans serve red snapper with a sweet and sour sauce.

b. In Mexico, chopped olives and red pepper are added to enhance the flavor and garnish the dish.

4. The Amazon and River Plata supply a great abundance of fish.

5. The huge shrimp and lobsters caught off the coast of Chile and Peru are famous the world over.

II. Nutritional information

A. Like beef and pork, fish is a complete protein, containing all of the necessary amino acids. A serving of fish provides the same amount of protein as an equal size portion of meat.

B. Fish has a low fat content although it is generally divided into two categories, fat and lean.

1. Salmon and mackerel belong to the fat group but still contain a fat content which is 20% less than beef or pork.

2. All shellfish would be included in the lean fish group.

3. One 4-ounce serving of fish contains about 100 calories, whereas the same portion of beef contains about 300 calories.

4. Because the fatty acids present in fish are polyunsaturated, fish can play a major role in low cholesterol diets.

C. The vitamin content of most fish is comparable to that of meat.

1. Fish are rich in the essential vitamins such as B vitamins, as well as A, D and K that are found in the fat fish varieties.

2. Oysters are a good source of the B vitamins, thiamine and riboflavin.

D. The mineral content and amount received from fish will be largely determined by the variety chosen.

1. Fish generally provide important amounts of phosphorus, iron, calcium, potassium, copper and fluoride.

2. One of the most important elements received from fish is iodine.

E. With the over 240 species of fish and shellfish on the United States market to choose from and the variety of ways that they can be prepared, it is easy to use fish in nutritious and healthy diets.

III. Two basic classifications of fish and seafood

A. Finfish have bones, fins, scales or heavy skins and tapering bodies.

B. Shellfish generally have a crustlike shell covering the body and are divided into two groups.

1. Mollusks, such as oysters and clams, are very soft in structure but are protected by hard, often hinged, shells.

2. Crustaceans, such as lobsters, crabs, shrimps and crayfish, are covered with a segmented, crustlike shell.

IV. Market forms of fish

A. Fresh fish can be purchased whole, dressed or drawn, or cut into steaks, which are the crosswise section, or fillets, which are the lengthwise section of fish.

1. Characteristics of good fresh finfish include:

a. A sheen with scales clinging tightly to the skin,

b. Skin that is firm,

c. Fresh odor,

d. Eyes that are bulging and bright, and

e. Flesh that will spring back when pressed.

2. Characteristics of a good fresh shellfish include:

a. A fresh odor,

b. A bright appearance,

c. Oysters having a creamy color, or

d. Clamshells that are tightly closed.

B. Processed fish that has been frozen can be purchased in many forms and varieties. The quality of packaged frozen fish can be determined by inspecting to see that:

1. Packages are wrapped in good condition,

2. Dating codes are on the package,

3. Packages are free from drips of ice frozen on the outside of the package (indicates that the package may have been thawed and refrozen), and

4. Packages were stored at 0°F. (-18°C) or below.

C. Processed fish which are canned include salmon, tuna, lobster, shrimp, sardines, oysters and crab can be found in some markets and quality may be determined by inspecting to see that:

1. Cans are free from bulging ends or indications of rust, and

2. Opened canned fish is stored in a tightly covered container and refrigerated.

D. Fish processed by drying, salted and smoked are still popular in many cultures.

1. Only lean fish should be processed through drying, cod being the most common kind.

2. Fat fish, such as mackerel and herring, may be pickled.

3. Salmon, haddock and herring may be smoked.

4. Cured fish should be stored in a dry, cool place.

V. Basic principles and techniques of preparing fish

A. Some principles of fish cookery can improve the product.

1. When cooking fish, expose the flesh to heat only long enough to coagulate the liquids.

2. Cooking fish at too high a temperature or for too long a time results in tough, dry fish and it will destroy their flavor.

3. Fish are properly cooked when the flesh loses its translucent appearance, becomes opaque and flakes easily with a fork.

B. Fish can be prepared by a variety of methods.

1. Baking is cooking by dry heat.

2. Pan frying is a method of cooking in a small amount of fat.

3. Deep-fat frying is cooking in a deep layer of fat.

4. Steaming is cooking by steam generated from boiling water.

5. Broiling is a dry heat method where the heat is direct, intense and comes from only one source.

6. Poaching is cooking in a simmering liquid.

C. The quality of prepared fish can be improved by using the following tips.

1. Fish to be breaded or stuffed is easier to handle if the fish is thawed first.

2. Frozen fillets and steaks may be cooked without thawing if additional cooking time is allowed.

3. Breaded frozen fish items should not be thawed before cooking.

4. Be careful not to overcook fish; fish is done if the thickest part of it flakes easily when tested with a fork.

VI. Catching fish is a primary method of obtaining fish

A. Fish can be caught by a variety of commercial methods.

1. Light mounted on a suction tube serves to attract and catch fish on large factory ships.

2. High voltage electrodes can be used to attract and catch fish which are drawn into a suction pipe and killed painlessly by electric shock, yielding as much as 2,000 pounds per hour.

3. Chemicals can also be used to attract and catch fish.

B. A major problem with catching fish is harvesting the "seed fish" needed for the reproduction and replenishing of the supply.

C. Another major problem is the still unanswered question of the "law of the seas" or which countries own the resources in them.

VII. Fish farming practiced worldwide, particularly in the Orient

(NOTE: In Formosa, fertilized ponds have yielded as much as 1,200 pounds of fish per acre, compared with 750 pounds of beef production per acre of prime pasture land.)

A. Proper feeding can more than double the amount of fish harvested from a given area.

B. Fish farming in ponds and lakes is currently more feasible than ocean farming.

1. One of the major problems with ocean farming, as with cathcing fish, is the still unanswered question of the "law of the seas" or which countries own the seas and the resources in them.

2. Another major problem with ocean farming is the harvesting of "seed fish" needed for the reproduction and replenishing of the supply.

(NOTE: Care will need to be taken in ocean farming to preserve the balance of nature since fish in the ocean live off other fish and if humans take certain fish out of the ocean for human food consumption, other species of fish may starve and become endangered.)

C. Fresh water or pond farming also has limitations because of the large amounts of energy needed to feed and transport the fish to markets.

D. Experimental methods of raising fish which live off waste and sewage have been tried in several areas.

(NOTE: This would be an excellent resource if people would only accept it, as a safe food because not only is a pollutant being removed but it is also being transferred into a food.)

1. Processes to take out toxic properties of sewage are being used and the sewage then used to grow aquatic plants which the fish eat.

2. Fish produced by these methods are high quality fish.

VIII. Fish Protein Concentrate (FPC)

A. FPC is a flavorless, tasteless, floury-like powder, three-fourths protein and another source of food from fish.

B. The substance can be manufactured in a variety of ways.

1. It can be made by removing the fats with solvents, followed by drying.

2. It can also be made by the physical removal of fats and water.

3. Enzymes or microbes can be used to change the biological nature of the protein.

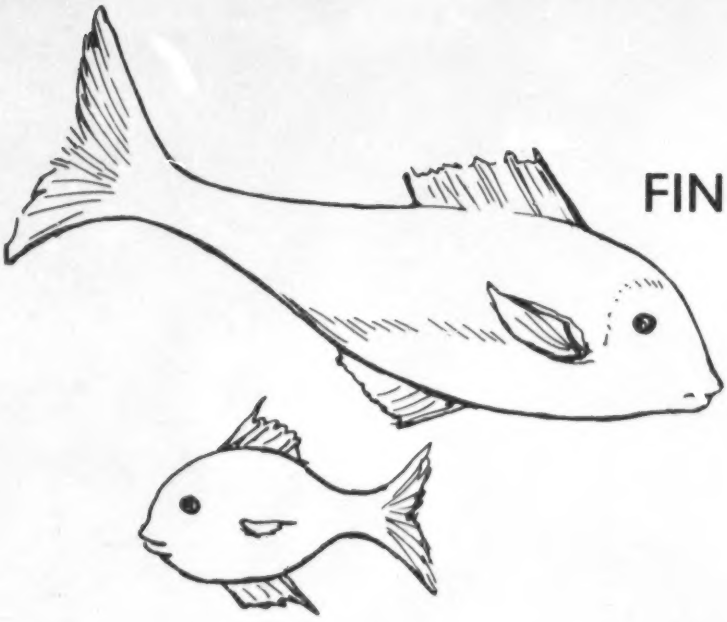
C A limitation is that fins, bones and entrails are often included in the tasteless powder, which some people find offensive.

D. FPC has two major advantages in the production of food.

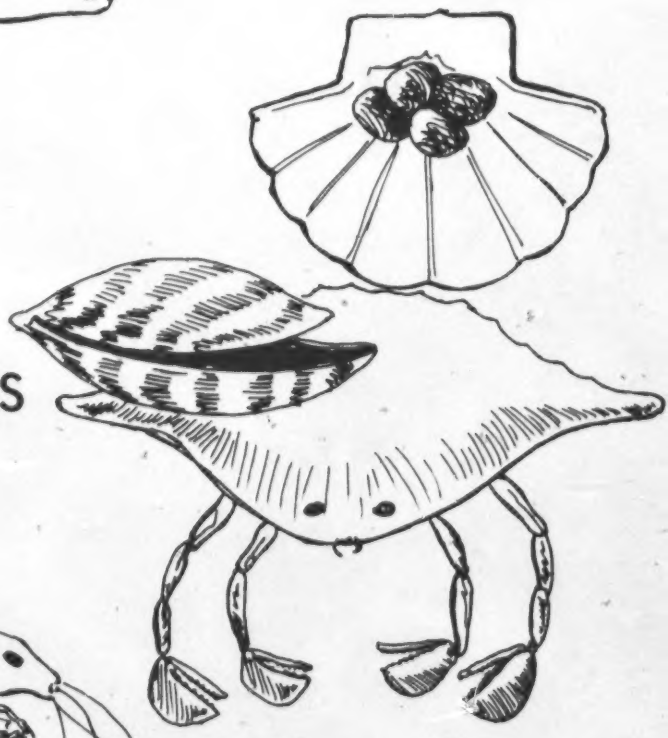
1. It provides a use for kinds of fish and parts of fish, including bones, fins and scales, which are not acceptable in their natural state.

2. It can substantially reduce losses through deterioration during transportation and it can be treated, stored and preserved very easily and comparatively cheaply.

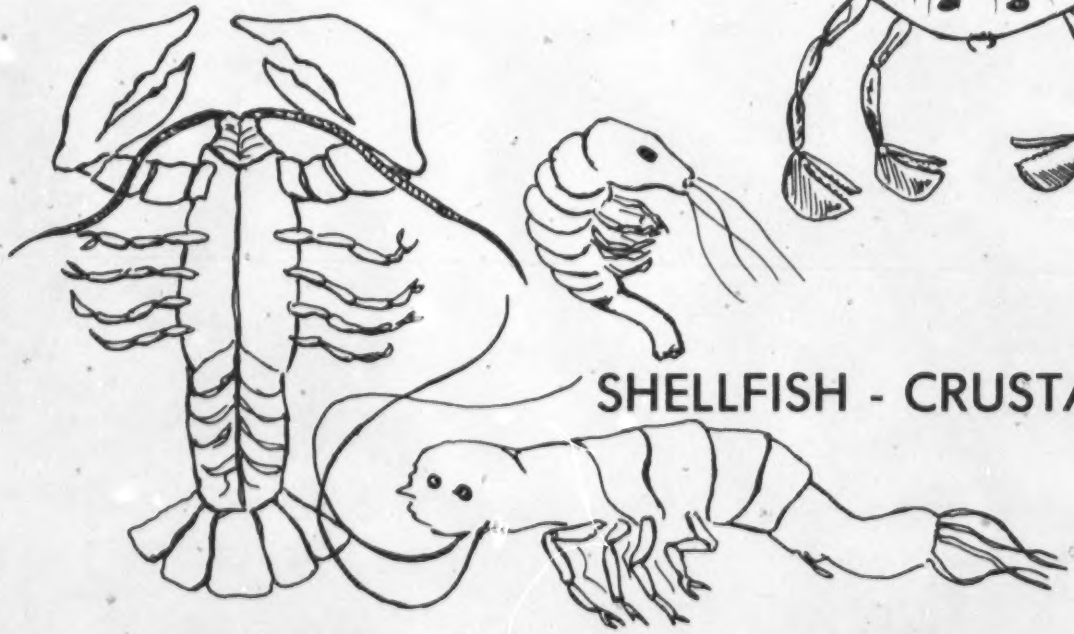
FISH AND SEAFOOD CLASSIFICATIONS



FINFISH

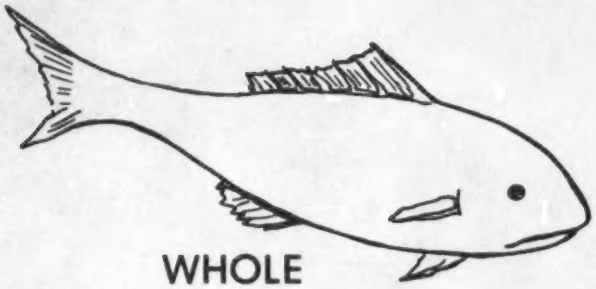


SHELLFISH - MOLLUSKS

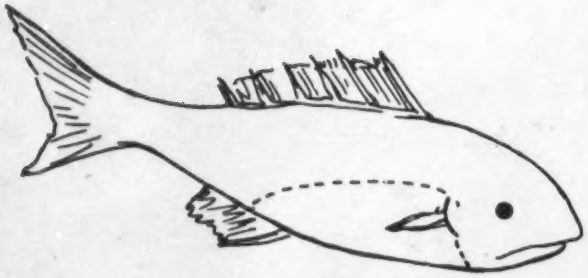


SHELLFISH - CRUSTACEANS

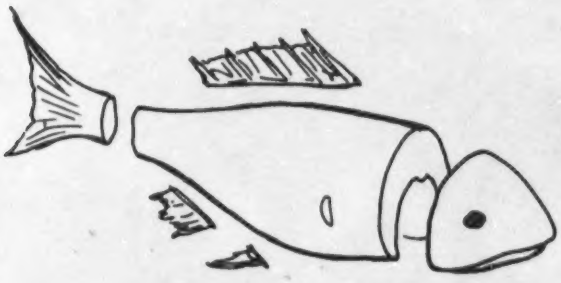
MARKET FORMS OF FRESH FISH



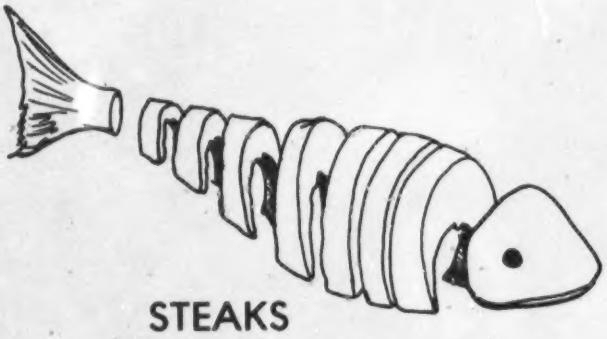
WHOLE



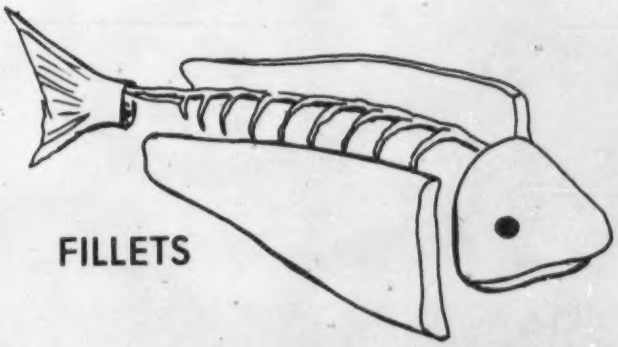
DRAWN



DRESSED



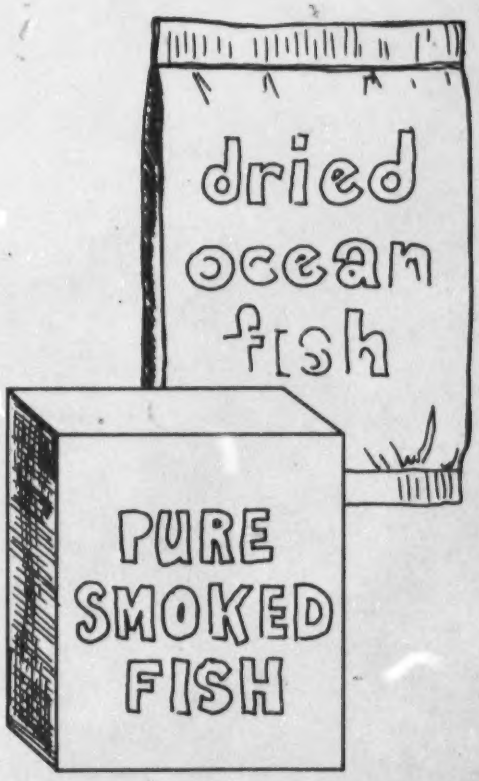
STEAKS



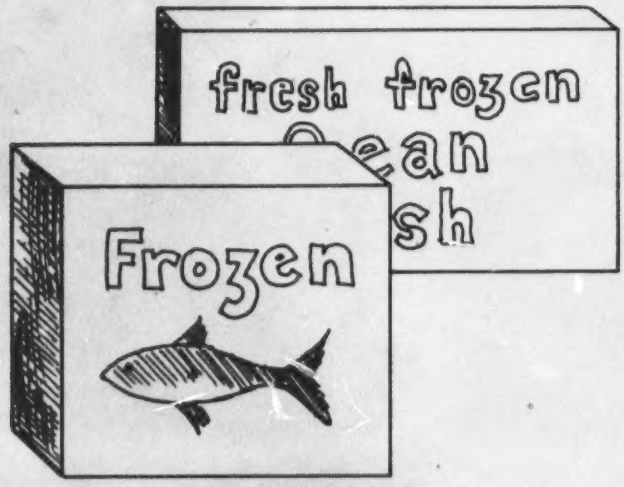
FILLETS

Market Forms of Processed Fish

CANNED

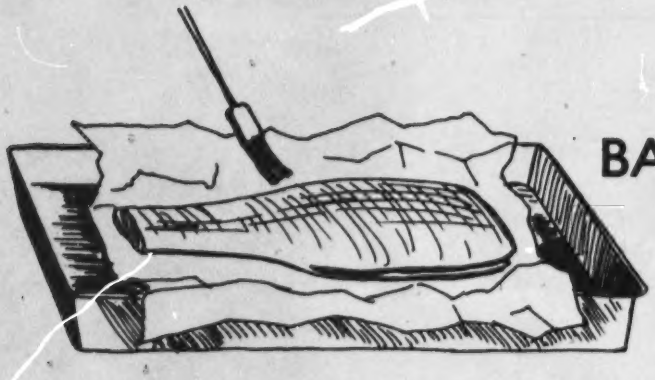


DRIED OR SMOKED



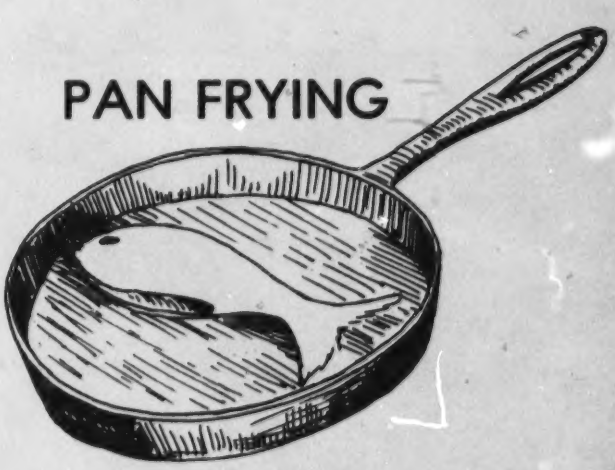
FROZEN

METHODS OF PREPARING FISH AND SEAFOOD

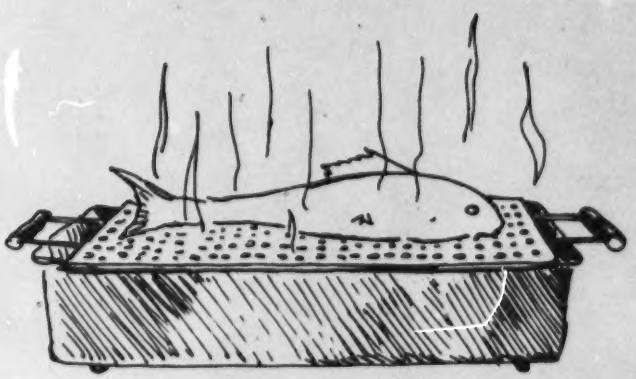


BAKING

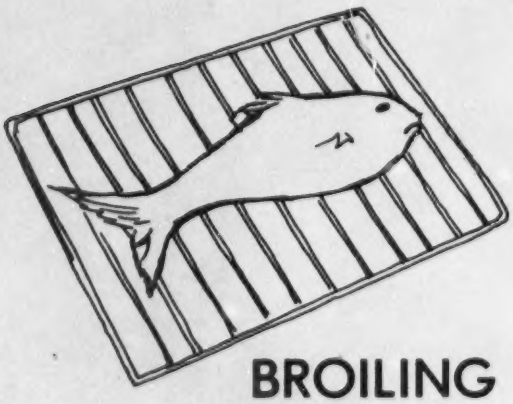
PAN FRYING



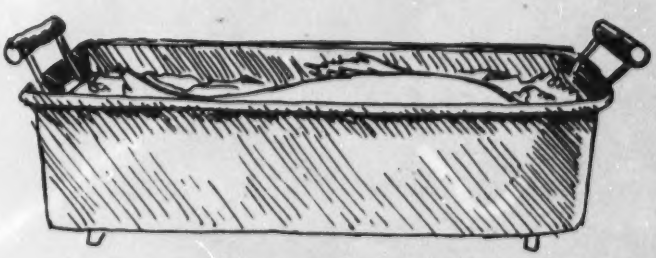
DEEP-FAT FRYING



STEAMING



BROILING



POACHING

FISH AND SEAFOOD
UNIT I

ASSIGNMENT SHEET #1: FISH AND SEAFOOD IN WORLD FOODS CROSSWORD PUZZLE

Directions: The following puzzle is designed to help you become familiar with the use of fish and seafood in various cuisines in the world. Write the word(s) in the corresponding numbered blanks on the puzzle form which complete the sentence or thought.

ACROSS

3. Germans are famous for their ___, including a fish variety.

4. One of the two preferred methods of preparing fish in China, making it moist and tender.

7. In Mexico this type of fish is frequently served with a sweet and sour sauce.

8. A popular white fish in Spain

11. A Samoan dish of seafood wrapped in leaves and cooked in glowing coals.

12. A Swedish traditional specialty of fish that is soaked pickled and dried

13. The "national fish" of Germany, frequently poached and served with melted butter.

16. The only body of water in the world where a delicately flavored pike-perch called fogas can be found.

17. Escargot or edible ___ are considered a gourmet fare in France.

18. A Danish dish which literally means bread spread with butter but is frequently piled with thick slices of fish

19. An important national dish in Belgium eaten with French fries and beer the year round

20. A Phillipine fish paste made from a fermented tiny fish called dilis

DOWN

1. In China, fish is eaten ___ in a variety of ways.

2. The Scandinavian name for fish dried on rocks

3. One of the two preferred methods of preparing fish in China making the fish moist and tender

5. This type of fish in Sweden is served in a variety of shapes, forms and flavors including marinated, smoked and in a sauce.

6. In Southeast Asia and the Pacific Islands this type of fish is prepared salted with onions and tomatoes producing a dish called lomi lomi.

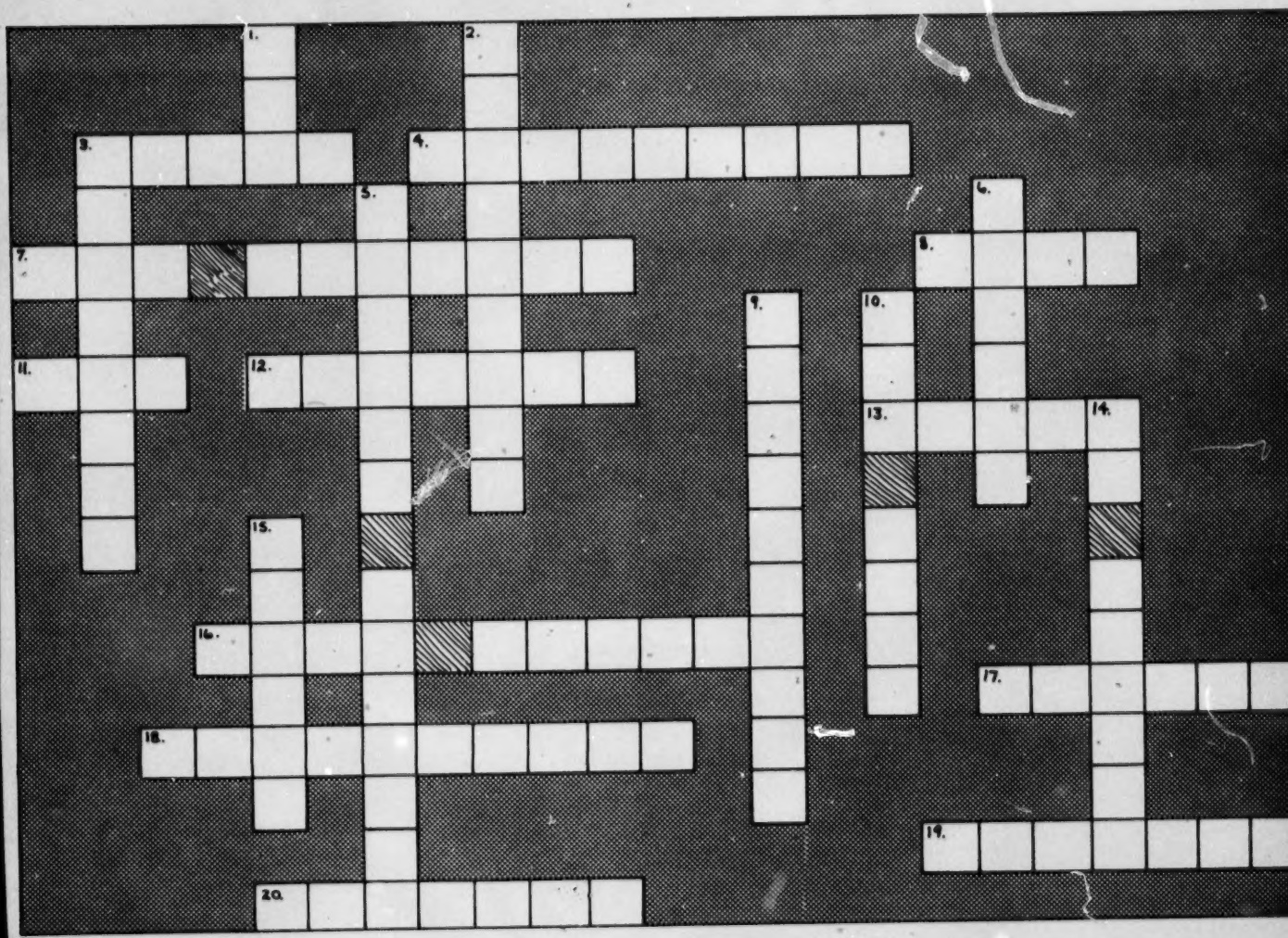
9. A popular Tahitian dish made of raw fish marinated in salted lime or lemon juice and then soaked in coconut milk

10. In the Netherlands these fish are smoked until soft and golden and served warm on toasted bread or as hors d'oeuvres

14. Luaus in Southeast Asia start with tender fish steamed in ___ ___.

15. In South America the River Plata and the ___ supply an abundance of fish.

30


1.
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20.

FISH AND SEAFOOD
UNIT I

ASSIGNMENT SHEET #2: FISHING FOR FOOD SCRAMBLE

Directions: The following word search puzzle is designed to help you become familiar with the present and future uses of fish and seafood in world foods. The 20 descriptions that follow will provide some assistance in locating the words. Locate the word(s) on the puzzle and circle the terms. Remember that the words may appear horizontally, vertically or diagonally.

A E M H G D P O A C H I N G N F B
C L O W C H O L E S T E R O L I D
H E L E R P W S D W A B C G J N O
P C L M U L D B R O I L I N G F U
C T U R S U E F R C S D E J M I B
H R S J T H B E E F O U R T H S L
E O K P A I K D N R Y P L X S H E
M D S W C W O H P E Q K A R T S D
I E F R E S H D B M R X D Q O L M
C S T X A R E F I L I G H T U B O
A C A N N E D L M N W O Y E G E L
L E P T S E W A G E E T N I H H L
S N A P M O V K O L D H G R U K U
N G D B O D Y L I Q U I D S T U S
P U S F I V T M B A N R B C N T K
H R I B O F L A V I N D S C P B S

1. The market form of fish that is available as whole, dressed, drawn, in steaks or in fillets is ___ fish.

2. The most common market form of processed salmon, tuna, sardines and oysters is ___.

3. When properly cooked fish loses its translucent appearance and becomes ___.

4. Cooking fish at too high a temperature causes it to be dry and ___, as well as destroying the flavor.

5. Fish should be exposed to heat only long enough to coagulate the ___.

6. The method of preparing fish in a simmering liquid is ___.

7. The method of preparing fish by an intense dry heat from only one source is ___.

8. Compared to the same size portion of beef, fish is what fraction of the calories?

9. Because the fatty acids present in fish are polyunsaturated, fish plays an important role in what type of diet?

10. Oysters are a good source of thiamine and ___.

11. One of the most important mineral elements in fish is ___.

12. Fish and seafood are basically classified as shellfish and ___.

13. Shellfish such as oysters and clams, because of their very soft structure protected by a hard hinged shell, are subdivided as ___.

14. Shellfish with a crustlike shell, such as lobsters, crabs, shrimp and crayfish, are subdivided as ___.

15. The commercial methods of catching fish use the three techniques of ___, ___ and ___ to attract fish.

16. Some of the experimental methods of raising fish use ___ after toxic properties are removed to grow aquatic plants for fish food.

17. One of the major limitations of fresh water or pond farming is the large amount of ___ needed to feed and transport fish to markets.

18. Proper feeding of fish can increase the amount of fish harvested by what proportion?

19. What proportion of protein is contained in Fish Protein Concentrate (FPC)?

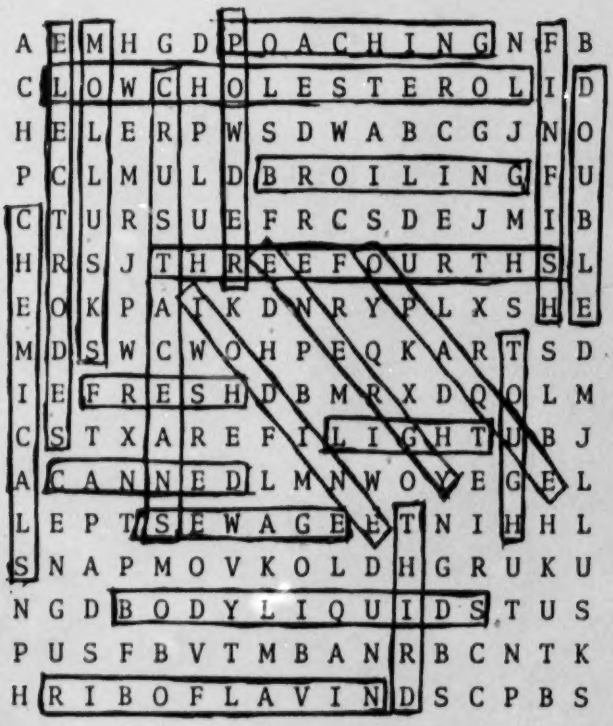
20. Fish Protein Concentrate is essentially a flavorless, tasteless ___.

ANSWERS TO ASSIGNMENT SHEETS

Assignment Sheet #1:

Assignment Sheet #2:

1. Fresh
2. Canned
3. Opaque
4. Tough
5. Body liquids
6. Poaching
7. Broiling
8. Thirds
9. Low cholesterol
10. Riboflavin
11. Iodine
12. Finfish
13. Mollusks
14. Crustaceans
15. Light, electrodes, chemicals
16. Sewage
17. Energy
18. Double
19. Three fourths
20. Powder


A E M H G D P O A C H I N G N F B
C L O W C H O L E S T E R O L I D
H E L E R P W S D W A B C G J N O
P C L M U L D B R O I L I N G F U
C T U R S U E F R C S D E J M I B
H R S J T H R E E F O U R T H S L
E O K P A I K D N R Y P L X S H E
M D S W C W O H P E Q K A R T S D
I E F R E S H D B M R X D Q O L M
C S T X A R E F I L I G H T U B J
A C A N N E D L M N W O Y E G E L
L E P T S E W A G E E T N I H H L
S N A P M O V K O L D H G R U K U
N G D B O D Y L I Q U I D S T U S
P U S F B V T M B A N R B C N T K
H R I B O F L A V I N D S C P B S

Name _____

Score _____

FISH AND SEAFOOD
UNIT I

TEST

Multiple-Choice: The following are multiple-choice items. Read each of the items and possible responses carefully. Choose the best answer and place the letter of your response in the blank to the left of the question.

____ 1. Generally, fish contributes which nutrients to the diet?

a. all essential minerals
b. all essential vitamins
c. all essential amino acids
d. none of the above

____ 2. Lean fish include:

a. salmon
b. finfish
c. shellfish
d. all of the above

____ 3. Because of the fatty acids present, fish is characterized as a ___ fat.

a. polyunsaturated
b. saturated
c. complete
d. incomplete

____ 4. Nutritionally, fish is a good source of:

a. Vitamin A
b. Vitamin B
c. Vitamin D and K
d. all of the above

____ 5. Compared to the same size portion of beef, fish contains what proportion of the calories of beef?

a. 1/4
b. 1/3
c. 1/2
d. none of the above

6. Nutritionally, fish is an important source of:

a. iron
b. calcium
c. fluoride
d. all of the above

____ 7. The two basic classifications of fish and seafood are:

a. finfish and shellfish
b. mollusks and crustaceans
c. scaled and finfish
d. none of the above

____ 8. When cooking fish it should be exposed to heat long enough to:

a. lightly brown the exterior
b. appear slightly opaque
c. result in a firm texture
d. coagulate the fluids

____ 9. One of the greatest problems of fish in worldwide food production is the:

a. practice of seasonal fishing
b. enzymes or microbes in the waters
c. unacceptability of the product
d. law of the seas

____10. The hard, hinged shells on oysters and clams are characteristic of the subdivision of:

a. crustaceans
b. mollusks
c. all of the above
d. none of the above

Matching: Identify the uses of fish and seafood in the various cuisines of the world by matching the popular or notable use of fish and seafood with the appropriate area or country. Write the letter of the best corresponding area or country in the space provided to the left of the description or use.

	USE OF FISH AND SEAFOOD
____ 1.	Hake, a whitefish, is popular
____ 2.	Lutefisk, a traditional specialty of fish soaked and pickled until it is approximately 4 times its original size and then dried.
____ 3.	Mussels are an important national dish.
____ 4.	Fogas, a delicately flavored pike-perch, is popular.
____ 5.	Raw fish are eaten in a variety of ways.
____ 6.	Red snapper is served with a sweet and sour sauce.
____ 7.	Edible snails are considered a delicacy.
____ 8.	Trout is considered a national fish, frequently poached.
____ 9.	Salted salmon fillets served with onions and tomatoes
____ 10.	The preferred methods of preparing fish and seafood are steaming and simmering.
____ 11.	Imu, seafood wrapped in leaves and cooked over glowing coals
____ 12.	Fish are often dried on rocks or on horizontal bars.
____ 13.	Fat eels are smoked until soft and golden and are served warm on toasted bread or as hors d'oeuvres
____ 14.	Trout are considered a "national fish."
____ 15.	Fish paste is made from fermented dilis, a tiny fish.

AREA OR COUNTRY	
A.	China
B.	France
C.	Germany
D.	Hungary
E.	Latin and South America
F.	Netherlands
G.	Scandinavia
H.	Southeast Asia and the Pacific
I.	Spain

Short Answer and Essay: The following are short answer or essay items. Briefly write the answer or response as requested in the space provided following each item.

1-12. Name the four market forms of fish and two indicators of quality of each market form. (12 points)

1. _____

   a. _____

   b. _____

2. _____

   a. _____

   b. _____

3. _____

   a. _____

   b. _____

4. _____

   a. _____

   b. _____

13-18. Name six methods of preparing fish and seafood. (6 points

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

19-24. Describe three basic principles of preparing or cooking fish. (6 points)

1.

2.

3.

25-34. Describe three methods of commercial fish catching and two major problems with these methods. (10 points)

METHODS:

1.

2.

3.

PROBLEMS:

1.

2.

35-44. Discuss in a short paragraph the advantages and limitations of fish farming in world food production, including new experimental methods. (10 points)

45-54. In a short paragraph describe fish protein concentrate (FPC), including how it is manufactured, and discuss its two major advantages and the major limitation in world food production. (10 points)

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FISH AND SEAFOOD
UNIT I

ANSWERS TO TEST

Multiple-Choice:

1. c
2. c
3. a
4. d
5. b
6. d
7. a
8. d
9. d
10. b

Matching:

1. I
2. G
3. F
4. D
5. A
6. E
7. B
8. C
9. H
10. A
11. H
12. G
13. F
14. C
15. H

Short Answer and Essay:

1-12. Answer should include the following four points and any two of their appropriate subpoints as given in Information Sheet, section IV, Market forms of fish:

1. Fresh fish can be purchased whole, dressed, or drawn or cut into steaks, which are the crosswise section, or fillets, which are the lengthwise section.

   (any two of the following quality characteristics)

   a. Finfish with a sheen and scales clinging tightly to the skin
   b. Finfish with a skin that is firm
   c. Finfish with a fresh odor
   d. Finfish with a flesh that will spring back when pressed
   e. Shellfish with a fresh odor
   f. Shellfish with a bright appearance
   g. Oysters having a creamy color
   h. Clamshells that are tightly closed

2. Processed frozen fish

   (any two of the following)

   a. Packages are wrapped in good condition
   b. Dating codes are on the packages
   c. Packages are free from drips of ice frozen on the outside of the package (indicates that the package may have been thawed or refrozen)
   d. Packages were stored at 0°F. (-18°C) or below

3. Processed canned fish

   a. Cans should be free from bulging ends or indications of rust.
   b. Opened canned fish should be refrigerated and stored in a tightly covered container.

4. Processed dried, salted or smoked fish

   (any two of the following points)

   a. Only lean fish should be processed through drying.
   b. Fat fish can be pickled.
   c. Salmon, haddock and herring may be smoked.
   d. Cured fish should be stored in a dry, cool place.

13-18. Answer should include any order of the following as given in Information Sheet, section V, Basic principles and techniques of preparing fish:

1. Baking
2. Pan frying
3. Deep-fat frying
4. Steaming
5. Broiling
6. Poaching

19-24. Answer should include the following points:

1. When cooking fish, expose the flesh to heat only long enough to coagulate the body liquids.

2. Cooking fish at too high a temperature or for too long a time results in tough, dry fish and it will destroy their flavor.

3. Fish are properly cooked when the flesh loses its translucent appearance, becomes opaque and flakes easily with a fork.

25-34. Answer should include the following points as given in Information Sheet, section VI:

Commercial methods of catching fish

1. Light mounted on a suction tube serves to attract and catch fish on large factory ships.

2. High voltage electrodes can be used to attract and catch fish which are drawn into a suction pipe and killed painlessly by electric shock.

3. Chemicals can also be used to attract and catch fish.

Problems

1. There are problems of harvesting the seed fish needed for the reproduction and replenishing of the supply.

2. As with ocean farming, there are still many unanswered questions of the "law of the seas" or which countries own the seas and the resources in them.

35-44. Answer should include the important advantages and limitations of fish farming in world food production as given in Information Sheet, section VII:

Advantages

1. Proper feeding can more than double the amount of fish harvested from a given area.

2. Experimental methods of raising fish which live off waste and sewage have been tried in several areas. These processes take out toxic properties and sewage is used to grow aquatic plants that the fish eat.

Limitations

1. There are still many unanswered questions in ocean farming of the "law of the seas" or which countries own the seas and the resources in them.

2. There are problems in ocean farming of harvesting seed fish needed for reproduction and replenishing the supply.

3. Fresh water or pond farming has limitations because of the large amounts of energy needed to feed and transport the fish to markets.

45-54. The answer should include the following important points in the description of Fish Protein Concentrate (FPC), including how it is manufactured, its two major advantages and its major limitation in world food production given in Information Sheet section VIII, Fish Protein Concentrate

1. Fish Protein Concentrate (FPC) is a flavorless, tasteless, floury-like powder, which is three-fourths protein and another source of food from fish.

2. It can be manufactured by removing the fats with solvents followed by drying, by the physical removal of fats and water, and by using enzymes or microbes to change the biological nature of the protein.

Advantages

1. It provides a use for kinds of fish and parts of fish, including bones, fins and scales, which are not acceptable in their natural state.

2. It can substantially reduce losses through deterioration during transportation and it can be treated, stored and preserved easily and comparatively cheaply.

Limitation

1. A limitation is that fins, bones and entrails are included in the tasteless powder, which some people find offensive.

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